

WHAT IS CLAIMED IS:

1. A method of etching a semiconductor substrate, the method comprising the steps of:

applying an etching paste comprising an etchant to a part or a layer of the substrate; and

heating the substrate, such that the part or the layer of the substrate upon which the etching paste has been applied is etched.

2. The method according to claim 1, wherein the etching paste comprises a caustic etching paste.

3. The method according to claim 1, wherein the etching paste is basic.

4. The method according to claim 1, wherein the etching paste is alkaline.

5. The method according to claim 1, wherein the etching paste comprises a synthetic etching paste.

6. The method according to claim 1, wherein the etching paste comprises a natural etching paste.

7. The method according to claim 1, wherein the semiconductor substrate is selected from the group consisting of a microcrystalline silicon substrate, a polycrystalline silicon substrate, an amorphous silicon substrate, a doped silicon substrate, a gallium arsenide substrate, a gallium arsenide phosphide substrate, a germanium substrate, and a silicon germanium substrate.

8. The method according to claim 1, wherein the etching paste is applied selectively to a major surface of the substrate to form a pattern of applied paste.

9. The method according to claim 1, wherein the etching paste is applied by a selective deposition method.

10. The method according to claim 9, wherein the selective deposition method comprises screen-printing.

11. The method according to claim 1, further comprising the step of:

doping a region of the substrate to yield a doped region of the substrate, wherein the step of doping is conducted before the step of applying an etching paste,

and wherein the step of applying an etching paste comprises applying an etching paste to the doped region of the substrate.

12. The method according to claim 11, wherein the substrate comprises a part of a solar cell, and wherein the doped region comprises an emitter region of the solar cell.

13. The method according to claim 1, wherein the etching paste is applied to at least one edge of the substrate.

14. The method according to claim 1, further comprising the steps of:  
forming at least one metal contact on a base region of the substrate; and  
forming at least one metal contact on an emitter region of the substrate.

15. The method according to claim 14, wherein the heating step yields an insulating region, wherein the insulating region is situated between the emitter region and the base region so as to isolate a metal contact from the emitter region.

16. A solar cell manufactured by the method of claim 1.

17. A semiconductor substrate upon which an etching paste is deposited, the etching paste comprising a solvent and a caustic etching agent.

18. The semiconductor substrate according to claim 17, wherein the etching paste further comprises a thickener.

19. The semiconductor substrate according to claim 17, wherein the caustic etching agent is basic.

20. The semiconductor substrate according to claim 17, wherein the caustic etching agent is alkaline.

21. The semiconductor substrate according to claim 17, wherein the caustic etching agent is selected from the group consisting of potassium hydroxide, sodium hydroxide, ammonium hydroxide, combinations thereof, and derivatives thereof.

22. The semiconductor substrate according to claim 17, wherein the solvent comprises water.

23. The semiconductor substrate according to claim 17, wherein the thickener is selected from the group consisting of a metal carboxyalkylcellulose salt, a hydrocolloid-forming cellulose, a starch, a physically modified hydrocolloid-forming cellulose, a chemically modified hydrocolloid forming cellulose, a physically modified starch, a

chemically modified starch, a strongly hydrolyzed polyacrylamide gel, combinations thereof, and derivatives thereof.

24. An etching paste suitable for use in etching a semiconductor substrate, the etching paste comprising:

a solvent;

a caustic etching agent selected from the group consisting of potassium hydroxide, sodium hydroxide, ammonium hydroxide, combinations thereof, and derivatives thereof; and

a thickener selected from the group consisting of a metal carboxyalkylcellulose salt, a hydrocolloid-forming cellulose, a starch, a physically modified hydrocolloid-forming cellulose, a chemically modified hydrocolloid forming cellulose, a physically modified starch, a chemically modified starch, a strongly hydrolyzed polyacrylamide gel, combinations thereof, and derivatives thereof.

25. The etching paste of claim 24, wherein the caustic etching agent comprises potassium hydroxide, wherein said thickener comprises sodium carboxymethylcellulose, and wherein said solvent comprises water.